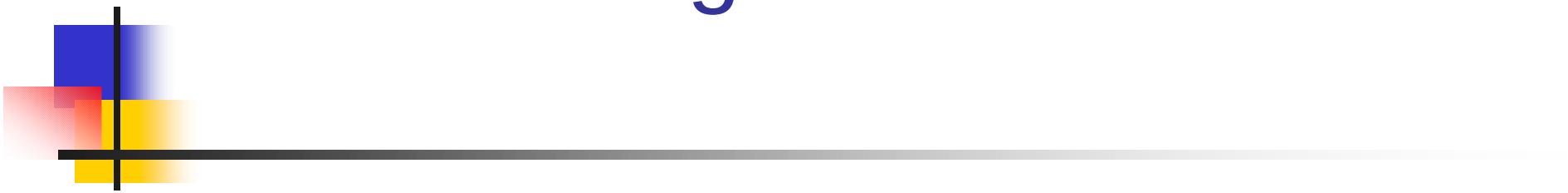
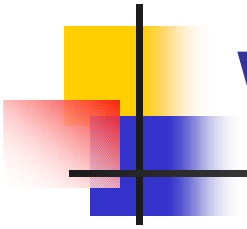
How should we publish data analyses in the web age?



Todd L. Graves

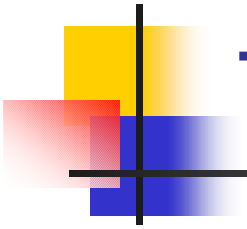
Los Alamos National Laboratory

April 8 2000



What this talk is about

- How does the web allow papers and journals to be different than they have been before? Data analyses have some special characteristics for which the web could be particularly helpful
- NOT about how to put existing papers or journals on the web
- Think of papers about data analyses, not about statistical methodology

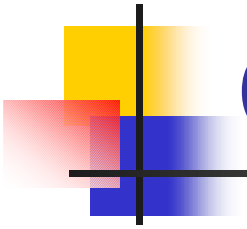


Thanks to

- Visualization group at Bell Labs (Naperville, IL)
- National Institute of Statistical Sciences

Target audience for new journal types

- People who read papers and think:
  - I want those data
  - I want that tool
  - I want to try out my own tool on this problem
  - I want to add my own data to this problem
  - I bet those morons screwed up the analysis
  - Where are all the other data analyses about this problem?
  - I just want to add my own two cents



Goals

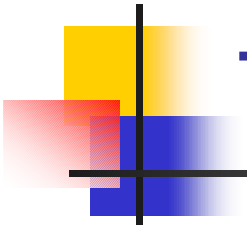
- You're reading a paper. You find the authors' discussion of the data analysis less than totally convincing. You can:
  - Play through authors' analysis step by step
  - Make (small?) changes and examine the result
  - Try out your own model/algorithm/tool
  - Add your own data to the author's
  - After completing your analysis, press a button to submit your comments to the journal and request refereeing

Reading data analyses on the web

- “Live Documents”: see papers by Mockus and others
- Interactive visualization and analysis applets
- Window containing steps of author’s analysis, which reader can play through
- ... and try out modifications. Are the author’s conclusions still valid if ...?

Introducing new (or old) data

- Popular press reports latest research findings as if no previous work exists
- If result is controversial and relatively well-studied, there will often be other relevant data, other analysis approaches, and other willing analysts
- Other data that bear on the problem should ideally be possible to add to the data set with a mouse click



Trying out your own tool

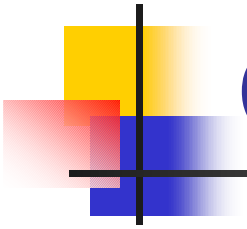
- Must write own code in Java, implementing the appropriate interface
  - Generate “AnalysisAction” objects, handle events generated by user interface, send notification to other components
- Security issues: subscribers to journal receive an encryption key

Submitting your own analysis

- After coming to your own conclusions, press a button to submit your own analysis.
- Security issues
- Presumably data analytic journals will not attract too many garbage submissions if subscription is required

Organization of a new journal

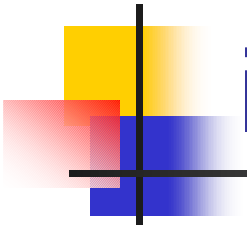
- Papers about the same topic (e.g. at what ages should all women have mammograms? Do particulates of a certain size cause death?) should be kept together, rather than papers published at the same time
- In this way, all data relevant to a given policy question are close at hand



Organization, cont.

- Journal includes a page containing links to “all” submissions and makes no claims about their quality
- But the front page links only to “refereed” submissions

Other applications for these ideas



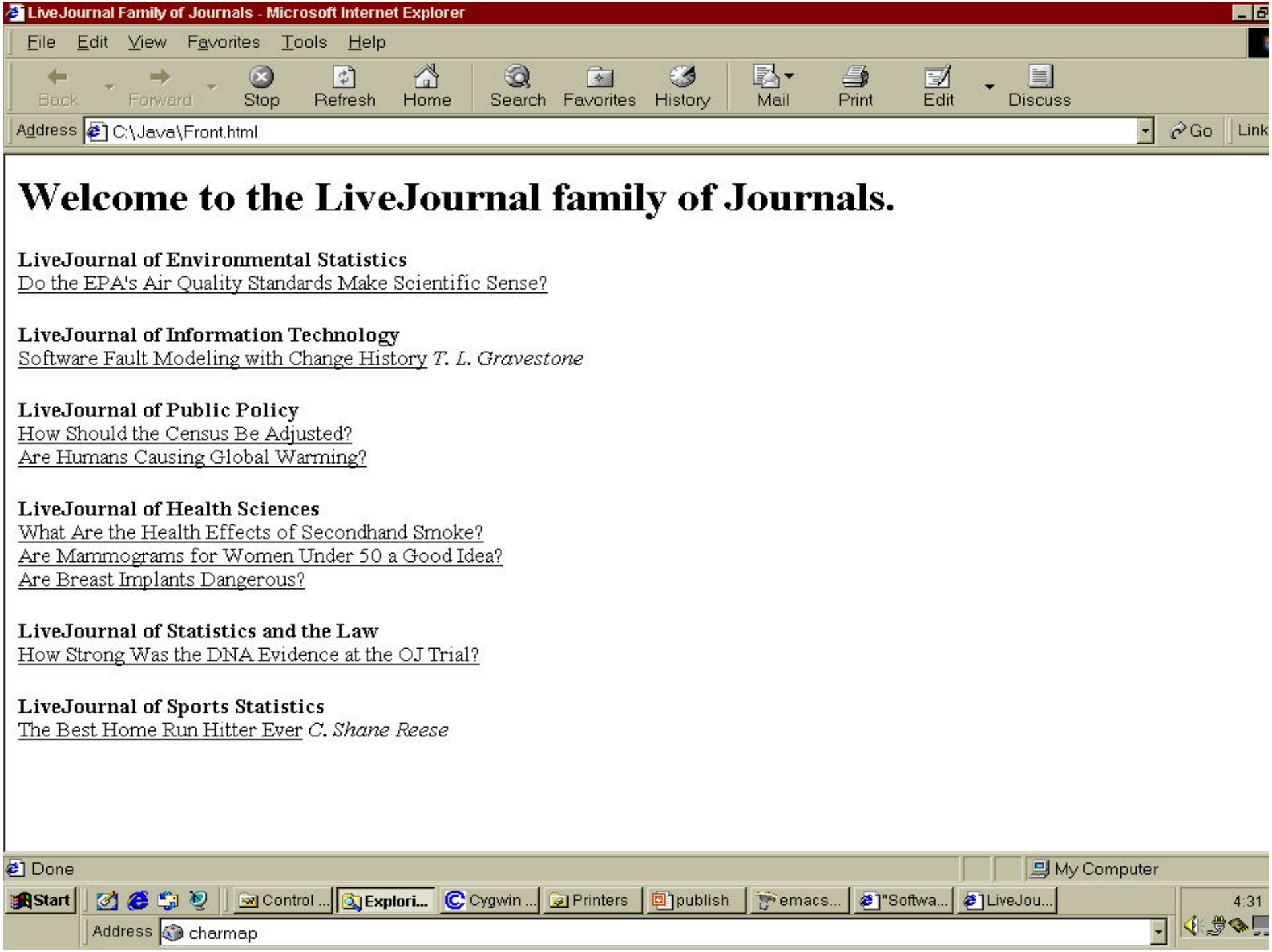
- Overcoming hostility to Bayesian analyses of controversial topics, if readers can pick own priors (and MCMCs run instantly...)
- Notebooks for individual researchers' analyses
- Collaborative research
- Education

Among the many obstacles

- Setting up infrastructure: funding? Army of volunteer developers?
- Greater difficulty of writing live documents
- Porting software to conform to interactive journal requirements
- Researchers often don’t want to “give up” their data
- Security issues
- Unfamiliar publication metaphor: can such a journal ever earn respect?

Conclusions

- Applied statistics can benefit from the web in unique ways
- Enriching the journal article reading experience, and reducing barriers to readers' transformation into researchers working on the same problem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Software Fault Modeling with Change History T. L. Gravestone
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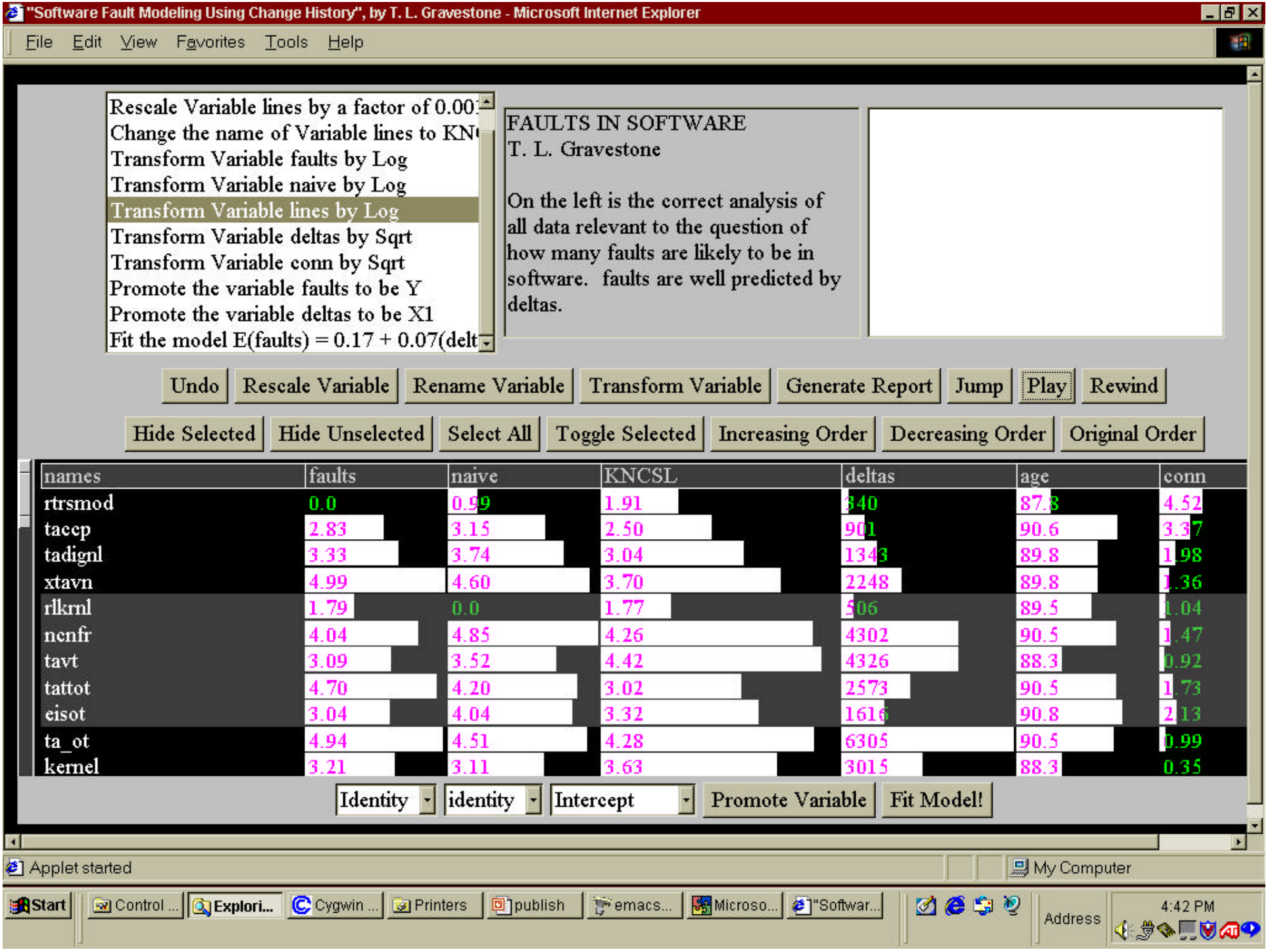
"Software Fault Modeling Using Change History", by T. L. Gravestone - Microsoft Internet Explorer
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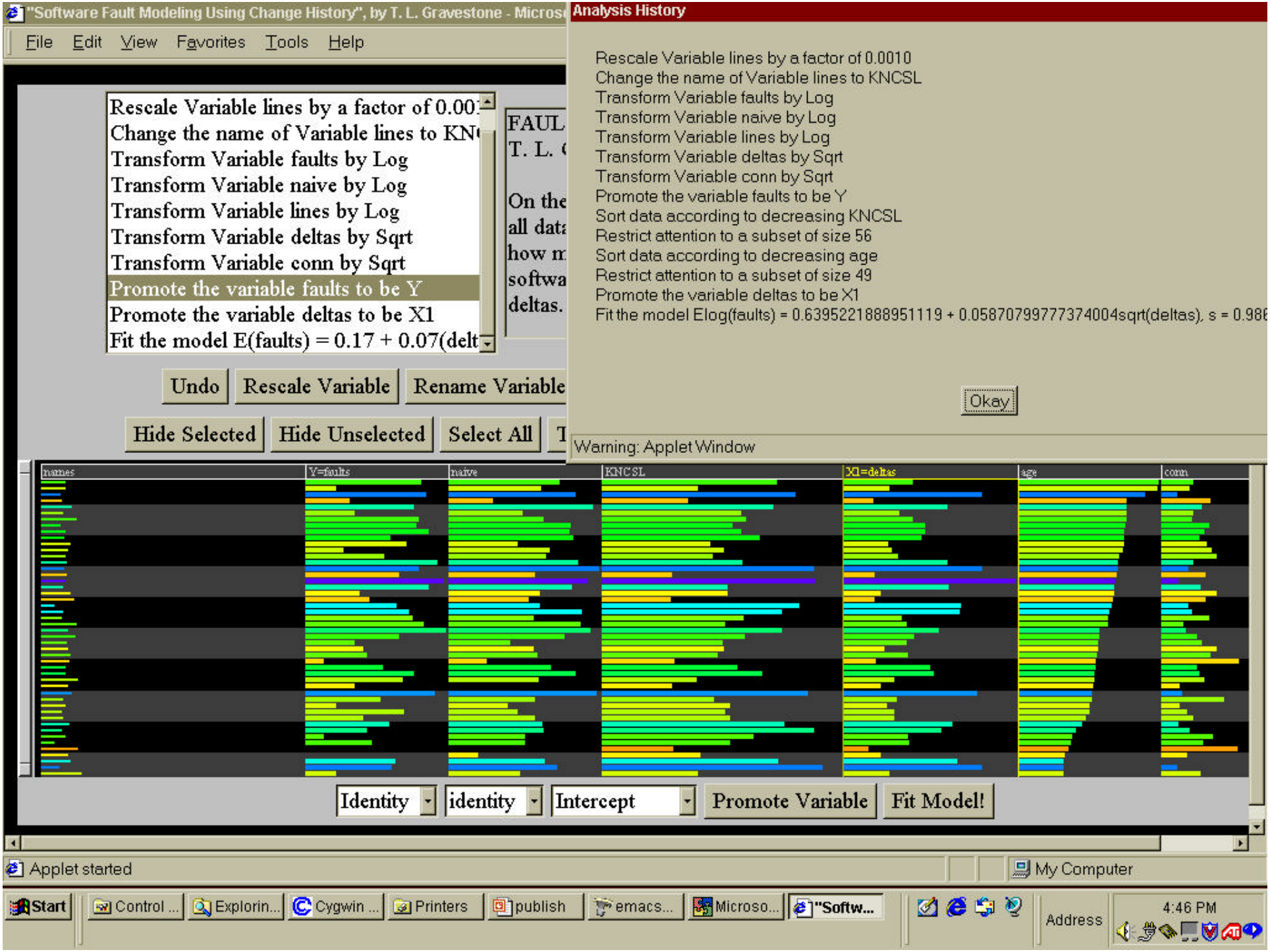
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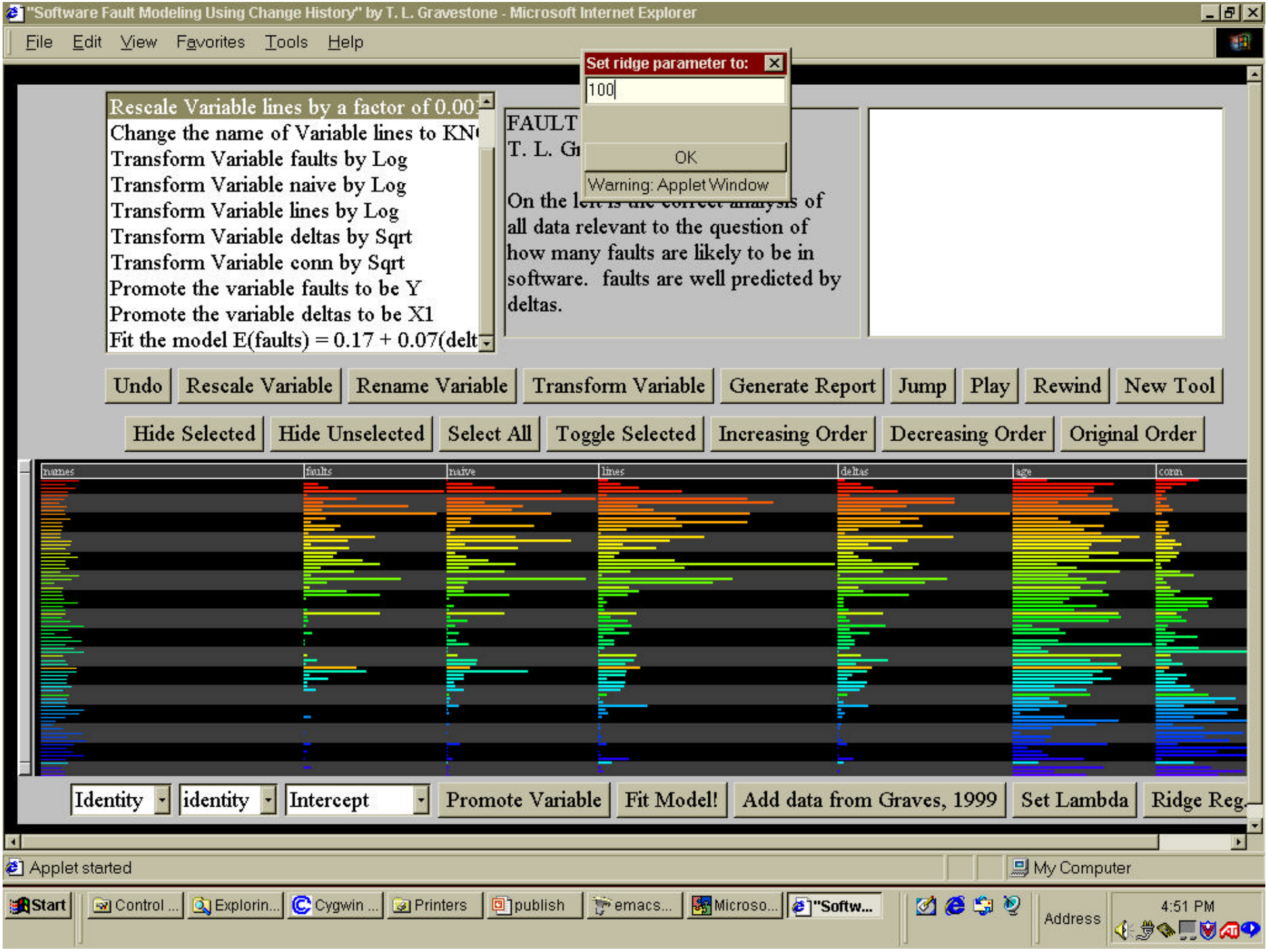
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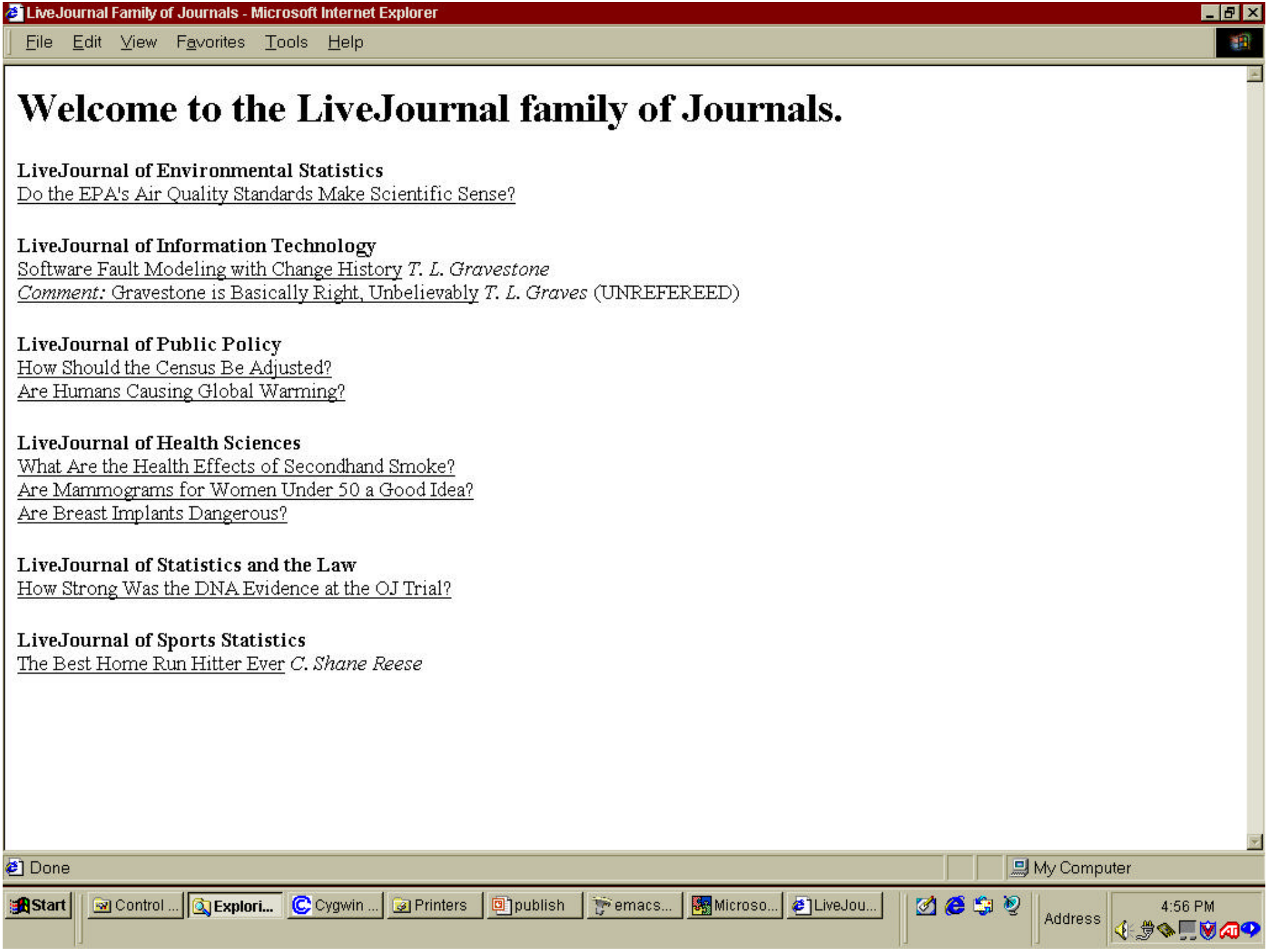
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Comment: Gravestone is Basically Right, Unbelievably T. L. Graves (UNREFEREED)
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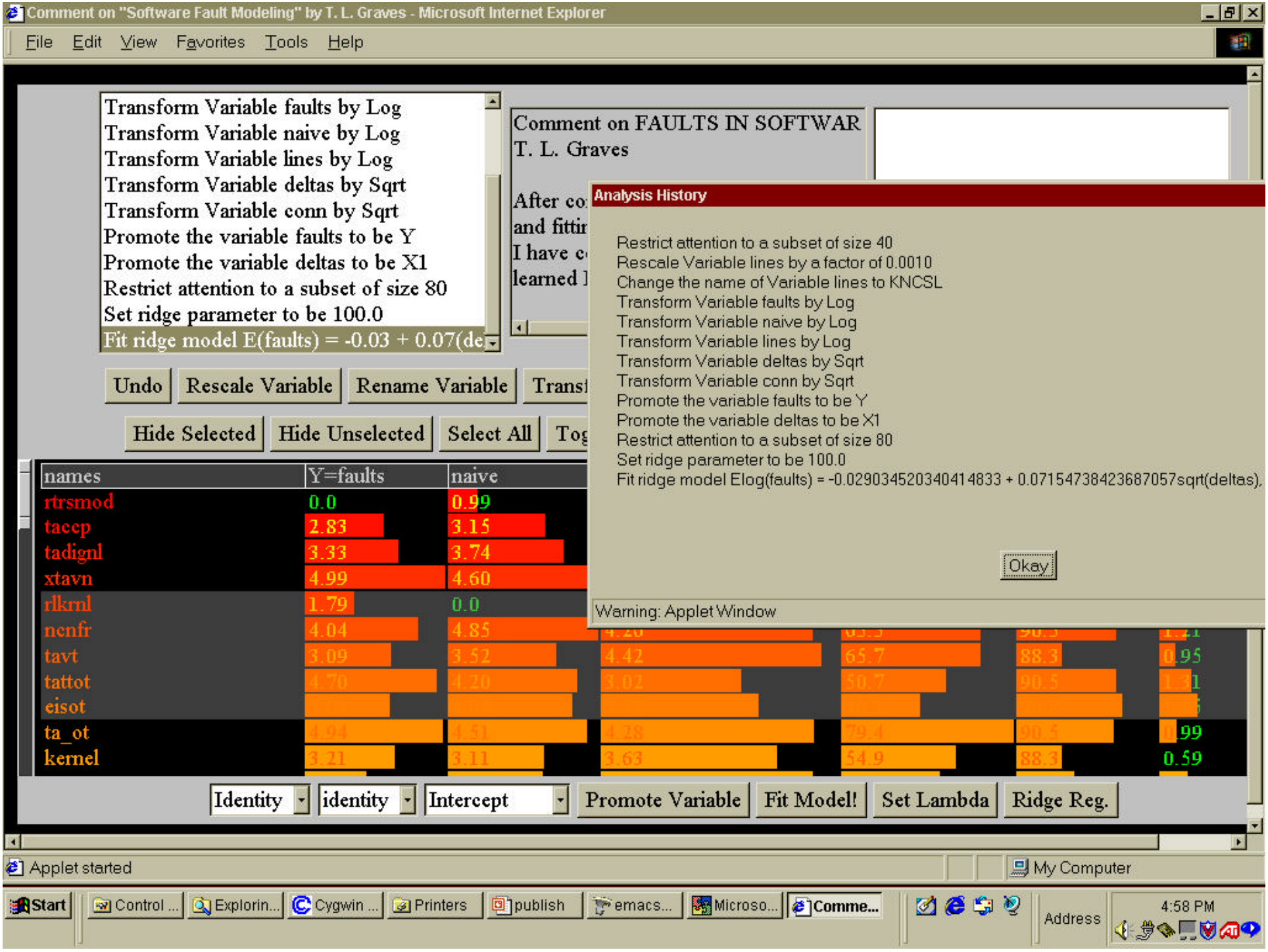
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